Natural Language Processing and Clinical Support to Improve the Quality of Reimbursement Claim Databases

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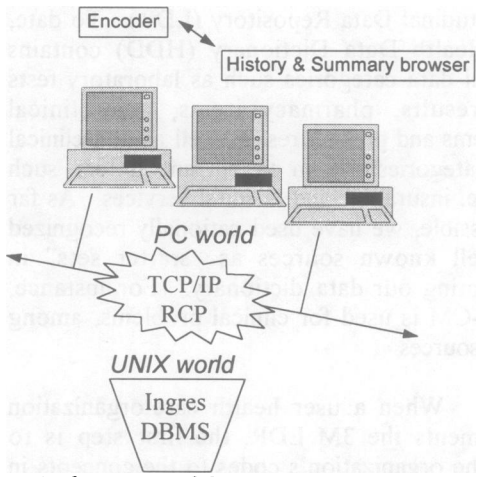
Quality encoding is crucial to ensure good clinical databases and correct reimbursement claims. The recent changes in the Swiss Health-care financing system has lead to the development in our hospital of a new encoding system for diagnoses and interventions. The main reason for the new concept of encoding was to increase its quality and exhaustivity. This has been achieved by associating the coding activity with the patient summary browser and the automatic production of discharge summaries. Jollis et al. have compared the database used for claims payment with a clinical database of 12'937 consecutive patients with cardiac ischemic disease and showed that claims data failed to identify more than one half of the patients with prognostically important conditions (*Jollis JG et al. Discordance of databases designed for claims payment versus clinical information systems. Ann Intern Med, 1993; 119:844-850*). Such databases are more and more used for clinical and epidemiological studies and their quality is a serious problem.

Conding activity

Clearly, the physician in charge of a patient provides the best coding quality. Therefore, it is necessary to increase his motivation and facilitate the coding activity through natural language supporting interfaces. At the present time, 18 medical departments and five outpatient clinics in our hospital have recorded approximatively 900'000 patient summaries since 1978. The new system that has run since July 1995 is based on a tool that helps the physician to find codes directly from narrative language. It is based on a semi-automatic engine that helps physicians to find the correct ICD codes. The system uses full lexical (grammatical and inflexion) descriptions of words to help physicians to get the correct ICD codes. The second component is the interface that enables the physician to associate a given diagnosis or therapeutics with their various modifiers to a given patient in a defined hospital stay. This application also allows the physician to browse through the whole history of the patient in a user-friendly interface and is a great help for managing patients when they come back.



Architecture of the patient coding system

Results

The paradigm of medico-economic encoding systems has been achieved with the implementation of a new architecture in our hospital. The main advantage of this system is to be able to associate the discharge summary and the medical patient history manager with the encoding activity. The physician in charge of a patient thus achieves optimal encoding of diagnoses and therapeutics, since this information will be reused to create a discharge summary and part of the medical electronic record.

After six months of use in the Medicine Department, >80% of the discharge letters have a correct ICD representation. The first results are extremely encouraging, although they are partly due to the recent introduction of a new system together with intensive instruction.

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